"USING DATA AND TECHNOLOGY" WORKSHOPS
WEDNESDAY APRIL 18

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How to Use and Interpret NOAA's Visualizations of Real Time and Historical Climate/Weather Data

Dan Pisut (NOAA) and Leon Geschwind (NOAA)
CONCOURSE 1

Come ask your questions to visualization experts from NOAA. Explore some of NOAA's best visualizations of climate and weather phenomena and learn how to use NOAA's tools for decision makers, including resources such as "Digital Coast", which shows impacts of sea level rise. This session will highlight NOAA's global, regional and local assets focused on climate, climate change, and weather.

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NOAA Climate Visual Information Design and Distribution

David Herring (NOAA), Hunter Allen (NOAA), Richard Rivera (NOAA)
COMMONWEALTH SOUTH (LEFT)

This session presents a behind-the-scenes perspective on how climate information goes from binary bits to fully contextualized information. We will walk the audience through the process of identifying data, working with scientists to understand what the data do and don't reveal, craft a message, and design a visual element to support those talking points. We will present examples of rendered data at various stages of production: from raw numbers to draft imagery to published products. We will invite discussion about how participants might use those products in their own endeavors.

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Building Your Own Apps

Dan Oostra (NASA LaRC)
CONCOURSE 2

Session would demonstrate how to use cloud-based, open source tools to create mobile science applications and build apps in real-time. Participants would discuss their experiences with mobile apps, app development, and possible uses in their organizations, and develop a concrete plan for creating mobile apps using non-traditional development tools.

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Introduction to NASA Data and Tools
Jim Acker (Giovanni) and Lin Chambers (MY NASA Data)
COMMONWEALTH SOUTH (RIGHT)

Participants in this session will learn about three user-friendly tools for access to NASA data (NEO, MY NASA DATA and GIOVANNI), see interesting examples of phenomena that can be explored, and find out how to learn more about each of these tools.

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Climate Models for Education
Mark Chandler (Columbia University)
CAVALIER C

This session will demonstrate the Educational Global Climate Modeling software, EdGCM, as well as a web-based tool, EZgcm, that is under development as part of NASA's Innovations in Climate Education program (NICE). The goal is to provide teachers with demanding, but interesting, activities that engage students in the science behind climate change. As such, EdGCM is a tool for helping educators meet the challenge of producing climate change-aware young adults, who are less skeptical about climate change issues since they can do the experiments themselves and arrive at their own conclusions - just like climate researchers. EdGCM has been adopted at numerous universities and colleges, but we believe it is flexible enough for many pre-college settings (grades 6-12). It may be of particular interest to teachers seeking to address new science education standards that increase the emphasis on climate science, computer simulation, and research in STEM curricula.

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Why Reinvent the Wheel?
Lindsay Knippenberg (NOAA) and Dwight Gledhill (NOAA)
CAVALIER B

Join a classroom teacher and an ocean acidification scientist to explore NOAA's climate education resources that are ready for use in the classroom, with a focus on resources for teaching the hot topic of ocean acidification.

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Learn How to Access and Leverage Climate Change Education Resources and Broaden Your Reach with CLEAN and CAMEL

CLEAN: Tamara Shapiro Ledley (TERC) and Susan Buhr (CIRES)
CAMEL: David Blockstein (NCSE) and David Hassenzahl (Chatham University)

CAVALIER A

CLEAN (Climate Literacy and Energy Awareness Network, http://cleanet.org) and CAMEL (Climate, Adaptation, Mitigation, E-Learning, http://www.camelclimatechange.org) are complementary NSF-funded projects that have developed resource collections and communities that your efforts can access and leverage, and to which you can contribute and broaden your reach. After a brief introduction to each project, you will have the opportunity to explore the portals in the areas that might be of the most direct interest to you and your projects. We will provide suggested avenues for this exploration and members of each project team will help and answer any of your questions as you search and discover what is available and possible. Possible explorations include:

- Browsing the CLEAN collection and the Gap Analysis to discover how your effort could fill holes in the collection.
- Understanding the CLEAN review process by engaging in a mock review
- Uploading a resource you have developed to the CAMEL collection
- Learning how to create your own subportal on CAMEL
- Pulling together a set of resources to help you teach a specific climate change topic (CLEAN and CAMEL)

The session will end with a brief discussion about what participants found and how they might interact in the future. We encourage you to visit each website before meeting and register as a user, as needed, to enable you to make the most efficient use of your time during this session. You will find the workshop most useful if you bring a laptop computer. Free wireless connectivity will be available.

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"USING INSIGHTS FROM THE LEARNING AND SOCIAL SCIENCES" WORKSHOPS
THURSDAY APRIL 19

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The Role of Values, Beliefs and Culture in Developing Effective Practices for Climate Change Education

Edward W Maibach (George Mason University) and Alejandro Grajal (Chicago Zoological Society)

COMMONWEALTH SOUTH (LEFT)

Audience segments respond differently to knowledge, emotions, cultural cognition and values. To develop effective practices for climate change education, the 'one size fits all' approach may not be effective. An understanding of how various motivations and reasoning influence audiences is essential. During this session we will develop a live discussion on how different audience segments in the Six Americas segmentation analysis may respond to various messages, and share experiences with participants on climate change education approaches to different audiences.

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Climate Science Education across Disciplinary Borders: How to Develop a Team of Climate Science Educational Leaders

Bill Mott (The Ocean Project) and Michel Boudrias (University of San Diego)

COMMONWEALTH SOUTH (RIGHT)

Climate change is a multifaceted environmental issue with diverse impacts. Educating audiences, from K-12 to undergraduates to graduates students and the general public, will require a team of climate science educators and a network of experts. This session will provide a framework to help build networks, from multi-disciplinary teams in one region to national and even international scales, and talk about how to work together. Topics open for discussion include training the trainers to deliver messages, cross-disciplinary training for your team, defining your audiences and using the proper resources.

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Translating Educational Resources for the K-12 Classroom

Carmelina Livingston (NSF), Lindsay Knippenberg (NOAA), Jean Pennycook (NSF), David Overbillig (DOE)

CONCOURSE 2

This session, being conducted by several of the 2011-2012 Albert Einstein Distinguished Educator Fellows, will examine the best way to support K-12 teachers in light of classroom teaching restrictions, the challenges of teaching climate change, and helpful considerations with teacher professional development opportunities, and curriculum and online resource development. Hear what teachers have to say!

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"USING INSIGHTS FROM THE LEARNING AND SOCIAL SCIENCES" WORKSHOPS
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Reaching Diverse Audiences

Mary Droser (University of California Riverside) and Jacqueline Patterson (NAACP)
CAVALIER B

In the US and worldwide, the impact of climate change is not equally felt by all. Economic status, race, and gender, are a few of the indicators that often correspond to levels of vulnerability and disproportionate impact of climate change. Those of lower socio-economic background are differentially adversely affected for a variety of reasons, including energy costs, resource availability and geographic location. Race/ethnicity can be a factor due to differing political power and marginalization in planning, culturally based geographic locations, and intersection with economic factors. Gender is also an issue due to traditional women's roles, differential political power, and intersection with economic issues.

We will address the challenge of training diverse populations from communities who have both often borne the brunt of environmental degradation and have been denied access to the tools of change. This training session will build on the Thursday morning panel discussion. The workshop discussion will focus around 4 issues related to reaching diverse audiences: 1) identifying the group that you are trying to reach, 2) what are the hurdles; 3) what are the best strategies for reaching any group and your group in particular and 4) case examples. We hope that participants will share their own experiences with these issues and challenges.

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Culturally-Responsive Evaluation Approaches

Gillian Roehrig (University of Minnesota) and Teresa Lloro-Bidart (University of California Riverside)
CAVALIER A

This session will discuss approaches to evaluation with culturally diverse audiences. In this session we will share approaches to evaluating teachers' knowledge of climate change including concept mapping, photo-elicitation interviews, and culturally relevant science teaching surveys. Student and mentor evaluation approaches include interview protocols and open-ended surveys. General techniques for developing these protocols will be discussed, which can be applied to many aspects of a program. Strategies for evaluating large events that serve diverse populations, the advantages of including participant-observation in the evaluation, and the importance of translating evaluation materials into the languages of the populations served by the grant, will also be considered.

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"USING INSIGHTS FROM THE LEARNING AND SOCIAL SCIENCES" WORKSHOPS
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Looking for Liftoff: Strategies for Widespread Dissemination and Scale-up of Effective Practices in Climate Change Education

Nancy Brickhouse (University of Delaware)
Hilarie Davis (Technology for Learning)
Theresa Schwerin (IGES)
CAVALIER C

Join this interactive session with representatives from the MADE-CLEAR and ESSEA projects. This session is framed around three questions:

1. What are some of the key obstacles to scaling up educational innovations in climate change education?
2. How do we design curricular/professional development programs on climate change that enhance their scalability?
3. How can we assess the breadth and depth of dissemination of our projects?

MADE-CLEAR is a natural outgrowth of Maryland and Delaware's shared regional climate change concerns and STEM (science, technology, engineering and math) education emphasis. Its primary goal is to build the partnerships among the states' research and teaching universities, public schools, federal agencies, and public and private sectors required to implement three targeted objectives:

1. Innovations in interdisciplinary P-20 (preschool through graduate school) climate change education,
2. New pathways for teacher education and professional development leading to expertise in climate change content and pedagogy, and
3. Better communication of climate change science for public understanding, using innovative outreach strategies that employ new technologies and informal education mechanisms.

Earth System Science Education Alliance (ESSEA) is a NASA, NSF and NOAA-supported program implemented by IGES to improve the quality of geoscience instruction for pre-service and in-service K-12 teachers. ESSEA supports more than 40 educational institutions across the country with online courses and modules for teachers in Earth system science. NOAA and NASA funding has enabled ESSEA to develop, pilot and provide climate change education modules to this network.

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Climate Change & Evolution: Parallels, Differences, and Lessons Learned

Roberta Johnson (NESTA) and Mark McCaffrey (NCES)

CONCOURSE 1

The tactics used by individuals and organizations to "teach the controversy" of climate change in the classroom are remarkably parallel to the strategies used to teach creationism in public schools-- claim the science being taught is "bad science," insist the implications of the bad science are detrimental to society, and then demand equal time. Such efforts to teach "both sides" in a science class are pedagogically and philosophically flawed and problematic. In the case of evolution, teaching creationism as "the other side" has been deemed illegal in public schools due to the separation of Church and State. But recent informal surveys and reports from schools around the nation reveal that many well meaning teachers, sometimes due to overt pressure but often of their own accord, teach "both sides" of climate change in science classes. This session will be co-lead by Roberta Johnson of the National Earth Science Teachers Association and Mark McCaffrey of the National Center for Science Education, who will provide participants with a brief overview of the current understanding of the research in this area, examples of how these findings impact implementation, and facilitate an active discussion with session participants, who will be invited to share effective experiences and insights into effective climate change education. A specific outcome of the session will be a brief list of effective strategies or examples that could be shared with others who did not attend this session.

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